

# AMATEUR RADIO

JULY  
1946

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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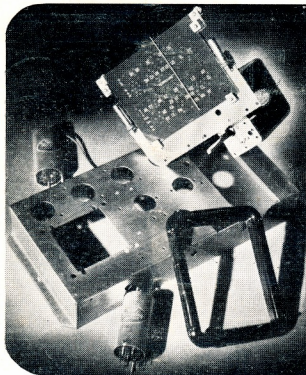
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## Editorial

The AUSTRALIAN AMATEUR is now permitted to use part of the 7 Mc and part of the 14 Mc band.

The allocated frequencies are:—

7150 Kc --- 7200 Kc

14100 Kc --- 14300 Kc

The use of these frequencies became effective on the 1st July, at 3 p.m.

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## CLEARING THE ETHER, SERIES II, Part III

\*By G. GLOVER, VK3AG.

This part deals, with the Operation of T.P.T.G. Oscillator, and faults likely to be encountered with same. Principles underlying the Construction of a modern transmitter. Electrical design features of one type of Basic Frequency Generator, with universal application.

### OPERATION AND CONSTRUCTION OF TRANSMITTERS.

In preceding sections the author dealt with problems associated with circuit components. In this section he proposes to deal with practical applications. In all probability the reader became weary of what might appear to be unnecessary stress laid upon simple points; however, as trifles make perfection, and it is usually the accumulation of these little trifles which constitute the big problem, it is not as unnecessary as first thoughts would indicate.

Before proceeding to describe the construction and operation of a modern transmitter, it would not be out of place to describe the actual tuning procedure employed with one of the oscillators detailed in previous section, and outline some of the faults which occur and the symptoms thereof.

**Tuning Procedure for T.P.T.G. Oscillators.**—The correct tuning of this outfit is as easy as falling off the proverbial log. If the following instructions are carried out.

Disconnect aerial feeders, set grid-leak at maximum (if variable unit employed), anode "tank" tuning capacitor as near desired frequency as can be "Guess-timated" from known inductance and circuit loading factors. Apply reduced value of H.T. to anode, and be ready at all times to take your foot off the key in the event of an excessive rush of current.

Now rotate the grid capacitor until the anode current "dips" to minimum value, then INCREASE the capacity slowly, watching the needle of meter carefully. Current indicated will increase slowly at first, then when certain point is reached, the increase becomes very rapid. At this point REVERSE the rotation of the dial until it moves just beyond the point of rapid increase. Now leave it there. The general tendency is to leave grid circuit tuned too near the resonant frequency of the anode circuit. Result: Oscillator either refuses to start or signals are "chirpy."

Next take your absorption frequency meter, more generally referred to as a wavemeter. What! you haven't got one? This simply goes to prove the writer's introductory remarks, about putting the cart before the horse. In any case, it is advisable to obtain, or build and calibrate, an absorption type meter before proceeding further. One cannot afford to be without such an indispensable piece of apparatus. Various types will be described in a later section.

To proceed with the good work. Place the meter just far enough within the electro-magnetic field of the anode tank to get reliable indication, and measure frequency. Readjust anode tank and repeat tuning operations until the desired frequency is achieved.

The next problem is to connect the aerial feeders and increase the anode voltage. Naturally both alterations are going to affect the frequency. The factors controlling change in frequency due to connection of aerial feeders are, nature of reactive load reflected, and tightness of coupling between the tank and aerial coils. Where it is desired that the aerial feeders should reflect

only resistive load, then an artificial load of desired resistance should be shunted across the aerial coupling coil, and the coupling of the latter to the anode tank coil adjusted until desired output is achieved before attaching feeders. Under these conditions, when the feeders are connected and adjusted correctly, there should be no change in the frequency, and the anode meter should register exactly the same current as when dummy load was connected.

When the aerial system employed contains reactive components, the anode tank capacitor must be readjusted to compensate for same; therefore, it is important to note that the Frequency Meter should be constantly applied after each change in adjustment or loading. Beware of over-coupling the aerial to a self-controlled oscillator, because "double wave emission" will result. Go outside and check the feeders, for single resonance indication after all other operations have been completed.

The Amateur who does not wish to go to the expense of an r.f. meter for the aerial circuit, can employ pealamps as indicators while adjusting the feeders. For best results pealamps should be short-circuited by a loop of wire, the loop size being chosen so that lamps are very dim, under these conditions small changes of current are easily perceptible. Where currents to be measured are too small to illuminate the lamp unaided, a low subsidiary voltage, furnished by battery or A.C. source, may be applied to the lamp via potentiometer and r.f. chokes. The voltage applied should only be sufficient to enable dim indications to be given when the r.f. is applied.

Where a variable grid leak is employed it will be found on reducing the value, that a point is reached where the anode current increases out of all proportion to the aerial current. At this point rotation of knob should be reversed until point is reached, where ratio of input to output is at its most efficient value.

### FAULTS.

The following examples of typical faults likely to be encountered with this type of oscillator, and the cause thereof, may be of some assistance when troubleshooting.

**Broad Wave.**—Caused by coupling aerial too tightly. Damping due to, modulation (harsh note), poor r.f. choke, high r.f. resistance in circuit, etc.

**Wobulation or Instability.**—Due to vibration of coils, r.f. choke, wiring, etc. Input power variation, or overloading. Aerial feeders swinging violently.

**Chirping or Breaking.**—Due to over-excitation. Aerial coupling too tight. Loose contact.

**Harsh Note.**—Incorrect excitation or adjustment. Placement of filament centre-tap. Poor filtration.

**Double Wave.**—Caused by aerial coupling being too tight, sometimes indicated by flickering aerial current.

**Excessive Anode Current.**—Anode voltage too high. Tube not oscillating. Value of grid-leak insufficient. Aerial coupling too tight.

**High Grid Current.**—Aerial coupling too loose. Feeders out of tune. Value of grid-leak insufficient.

**Creeping.**—Due to heating of overloaded tube or grid-leak. Inductance capacitor, r.f. choke, etc., heating.

### CONSTRUCTION AND OPERATION OF MODERN TRANSMITTER.

The first point which has to be considered is the overall design of the whole set up. Bread-board, Standard Relay Rack, Cabinet, or Console. Which is it to be?



The Bread-board set up is definitely the most efficient and accessible for experimentation with an individual unit, but represents very poor space economy for the entire set up.

The Standard Relay Rack represents a good compromise between the bread-board and cabinet set-ups, and has the advantage that standardized units and assemblies can be readily interchanged.

The Cabinet provides means of dust-proofing and fool-proofing the equipment, but is more costly. However, the cost is offset by the fact that a well-designed and constructed cabinet can be employed by the Flat-dweller, whose activities are restricted to the Living Room, without offending the most critical housewife.

The Console represents the ideal method of construction for the "Ham," who is only interested in "Brass-Pounding" or "Drooling into the Mike," while seated at a beautiful piece of furniture located in the luxurious surroundings of the Lounge, but hardly meets the requirements of the true experimenter. The latter may experience all the thrills of lounging while operating, by employing a small consolette, housing remote control equipment to operate the main rig.

The writer has evolved a system which combines all the best features of the Rack and Cabinet systems. It consists of employing a Standard Relay Rack enclosed in "Frameless" Cabinet, so constructed as to enable modifications of size to suit height and number of racks employed.

The next point to be considered is the "Scope" of the set-up. To be completely modern it must be capable of expansion, unit by unit, until the final goal is achieved. As the true experimenter does not recognise a "finite goal," the rig must be capable of endless expansion.

By suitable switching and patching it should be capable of:—

- (a) Transmitting telegraphic and telephonic intelligence on all frequencies, present and anticipated, in the H.F., V.H.F., and U.H.F. spectrums.
- (b) Certain units should be adaptable for use in Frequency Modulation, Facsimile, Television and Pulse transmission experiments.
- (c) Provision should be made for the inclusion of S.H.F. or Micro-Wave Technique.

Quite a tall order you will admit; but nevertheless possible. Naturally only certain units are common to the requirements of (a), (b) and (c), but switching and patching can work wonders.

Another very important point is "Economics." Our design must make provision for:—

- (i) Expansion to meet requirements of "A" and "B" Licence.
- (ii) Expansion at a rate determined by the depth of user's purse.
- (iii) Experimentation and communication with interim equipment.
- (iv) Changes of set up at minimum cost.
- (v) Avoidance of waste, due to necessity for discarding units as equipment grows.

The answer to all this is, simple subdivided, plug-in, units of universal design and application, such as will be described in succeeding sub-sections.

Last but not least of the major considerations is "Standardization." While many Amateurs are already using Rack and Panel outfits, in many cases the racks are made of wood or, incompletely and incorrectly drilled, and of non-standard dimensions. The same applies to panel sizes.

By using equipment of standard dimensions one is able to readily interchange units, and obtain standard "Blanks" drilled and punched to suit individual requirements. The writer cannot stress too strongly the advisability of "Standardizing." The standard width of panels is (19 in.) nineteen inches, and the height

progresses in one and three-quarter inch (1½ in.) units, as indicated in Table hereunder:—

No. of Units.	Size.	No. of Units.	Size.
1	1½ in.	7	12½ in.
2	3½ in.	8	14 in.
3	5½ in.	9	15½ in.
4	7 in.	10	17½ in.
5	8½ in.	11	19½ in.
6	10½ in.	12	21 in.

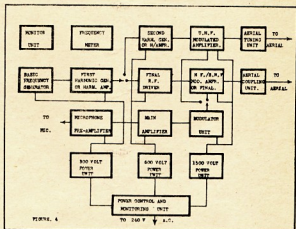


Figure 4 is block schematic covering operation (a) and is the basis for discussion in the succeeding subsections.

Now to break the circuit down into units in their correct order of priority, commencing with the "Basic Frequency Generator."

**Basic Frequency Generator or B.F.G.**—The major requirements of such a unit are:—

- (i) Stability.
- (ii) Frequency Coverage.
- (iii) Spot Frequencies.
- (iv) Compactness.
- (v) Minimization of Controls.

**Stability (I).**—Yes, this is definitely the major feature required of the B.F.G., for without it the whole system is N.B.G. Stability calls for rugged components and construction. Furthermore, it demands constant loading and temperature, also frequency elements unaffected by external influence.

A preceding section covered various types of oscillators and outlined their advantages and disadvantages. Any one of these oscillator circuits may be employed to satisfy (i). The actual form taken by the components, and the lay-out is the problem we are confronted with here; plus one additional problem, that of maintaining constant loading. This is most easily accomplished by employing a "Buffer Amplifier," operated in the Class "A" region. Hence our unit consists of two valves, the actual oscillator, and its associated buffer.

**Frequency Coverage (ii).—**With the expansion of "Ham" activity into higher and higher frequencies, changes of bands brought about by International Conventions, necessity for providing emergency frequencies, and other contingencies, a wide frequency coverage is demanded. Hence, the B.F.G. must be capable of generating a range of basic frequencies wide enough to permit, "Harmonic Generators" or "Harmonic Amplifiers" employed, to provide final frequency required. Experi-

ence indicates that V.F.O. tunable from 1.5 to 2 Mc. will meet all requirements, and provide for emergency operation in this band.

The reader will no doubt recall that the writer stated earlier that the E.C.O. circuit represented an excellent method of achieving flexibility. Hence it has been chosen for the B.F.G. under discussion.

**Spot Frequencies (iii).**—It is desirable to have available certain frequencies to which we can switch readily. From time to time circuits have appeared whereby this could be achieved by employing a special unit located on the operating table. At the conclusion of this series of articles, the writer proposes to publish a separate paper outlining a modern remote controlled system, for the present it is his intention to deal only with the more conservative type of manually operated unit. With either system the best method of achieving spot frequencies is by using Piezo-Electric Crystals. Where crystals are not available "Fixed-Tuned L.C. Circuits" may be employed.

**Compactness (iv).**—In order to maintain the highest degree of space economy, reduce distributed reactances and circuit losses to a minimum, and minimize overall weight, it is necessary to keep all components as small as is consistent with the requirements of power, insulation, efficiency and stability.

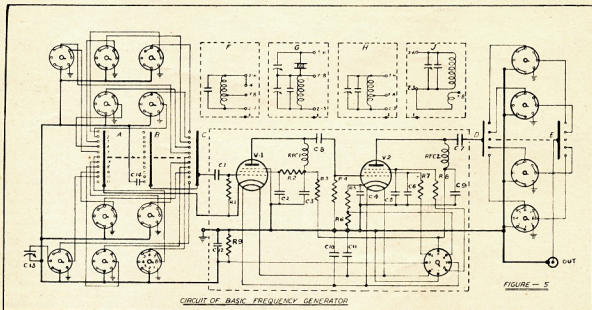
**Minimization of Control (v).**—If quick changes of operating frequency are to be made, controls must be reduced to an absolute minimum. This is best achieved by employing ganged controls, or spot frequencies, in conjunction with band-pass and untuned stages where practicable.

choke, and ensures continuity of grid circuit at all times.

(b) As the drive available to the Class "A" buffer amplifier is quite sufficient without the necessity of tuning the input circuit, the circuit is simplified by eliminating the third set of tuning elements. Furthermore, the fact that the input to the buffer is untuned serves yet another purpose, that is, the fact that input is not sharply peaked reduces effect on oscillator when the suppressor circuit of buffer amplifier is keyed.

(c) It has been previously stated that, in order to secure maximum stability it is essential to offer constant loading to the oscillator circuit. However, we are faced with certain complications if we desire to use (BK), break-in operation to you, because we cannot tolerate strong signal from the oscillator swamping the receiver. Many Hams "Key" the oscillator for this reason, and stability suffers as a consequence. The alternative is to let the oscillator run, and key a succeeding stage. This means that the oscillator must be carefully shielded and filtered. Furthermore, keying must take place before the level of output has reached a value, which would be beyond the suppressive capabilities of normal shielding and filtering. The obvious choice is the buffer amplifiers; but if we operate or key this valve in such a manner as to change the loading on the oscillator, instability results.

Our circuit represents the best compromise possible, that is, a penthode valve is used as an electron-coupled oscillator, thus providing a certain amount of isolation between the frequency determining circuit, and the buffer stage. The untuned nature of the buffer grid circuit



### CIRCUIT.

Figure 5 depicts circuit B.F.G. The section within the dotted lines represents the "valve section," and contains the unvariable components associated with the operation of the valves.

**Some Electrical Aspects of the Valve Section:—**

(a) The R/C combination in the grid circuit of the oscillator provides necessary operating bias, and at the same time the resistor eliminates the necessity for r.f.

still further reduces reaction, and the use of suppressor control ensures minimum reaction due to changes in valve parameters during keying. Suppressor keying also provides smooth signals, particularly if the correct "thump" filter is employed to give desired wave front.

(d) Both tubes are of the receiving type, hence when crystal-control is employed, very little load is placed on the "rock."

(e) Small resistors in series with cathode of each tube

(Continued on Page 26)

# DIRECT DISC RECORDING

## PART III—THE TRAVERSING MECHANISM.

(Based on a Lecture delivered to the Sound Recording Institute of Australia by Mr. R. Kinley.)

Part II of this series was devoted to the choice of the first mechanical element of a disc-recording plant, namely, the turntable and its driving system, and it is proposed here to review the associated equipment which serves to draw the cutting head radially across the surface of the disc and thereby generate the well-known spiral track. As was mentioned earlier, the mechanical aspect of a recording machine is very similar to the engineer's screw-cutting lathe, and the similarity will become even more apparent when we examine the action of the cutting head and stylus.

Commercial gramophone records operating at 78 r.p.m. usually employ a spiral track pitch of about 96 lines per inch, and this enables playing times of about 4 and 3 minutes to be achieved for 12 inch and 10 inch records respectively. Such a groove spacing will permit amplitudes of up to 0.010 inch to be attained, and these are sufficient to operate a wide range of playback pickups and acoustic reproducers. In the case of amateur recording, however, it is probable that such a variety of playback devices need not be catered for, and that a lightly-damped electric pickup will invariably be used. It thus becomes possible to produce satisfactory recorded volume levels with smaller amplitudes, provided that the signal-noise ratio (so well-known to "Hams") is sufficiently great. The noise in this instance is "needle scratch," and is due to microscopic variations of a random nature in the surface of the grooves of the record, and which can be kept at very low levels by taking adequate precautions when recording. It is therefore only necessary to maintain amplitudes which will be sufficient to yield a signal which is well above the noise level, and closer groove spacing can be employed, with the attendant advantage of securing a longer playing time per disc.

With slow-speed recording, such as at 33.3 r.p.m., other considerations (which will be considered later) place a limit on the maximum permissible amplitude, and again it will be seen that a closer groove spacing can be adopted with advantage.

Traversing mechanisms for amateur work should therefore be chosen with a view to the ultimate use of the discs produced, and the optimum spacing of the grooves in this regard. Recording practice in various parts of the world has adopted 96, 112, and 120 lines per inch as standard groove pitches, depending upon the subject matter, and in some instances as many as 144 lines per inch have been employed.

Traversing gear for disc recording falls into two main types, depending on whether their mechanism is located above or below the turntable. Their functions are identical, but each has certain preferred features from the point of view of operating convenience.

The first type is that which operates from below the turntable, and is probably the simplest in principle. The cutting head is mounted on an arm similar to the conventional playback pickup, but carries on its pivot shaft, and below the turntable, a sector plate or gear wheel which is driven from the centre spindle by means of a chain of reduction gears. In this way the arm is gradually advanced across the surface of the disc with each revolution of the turntable, and means are provided for de-clutching the gear-train whenever the cutting head is raised. This form of mechanism is finding increased popularity with commercial recording units from over-

seas, because of its inherent simplicity and ease of operation by the least technically-minded operator. From the point of view of the recordist who may require more versatility in his equipment, however, there are several disadvantages in this arrangement, and it may be as well to review a few of these at this point.

In the first place, the mechanism, while simple in character, is not easily constructed in the home workshop, nor is the use of a lathe much of an advantage in making the gears, etc. Commercial interests who contemplate quantity production of such units are prepared to secure the necessary plant for such purposes, and can then readily produce them at reasonable cost.

From the operating point of view there are other mitigating features, chief of which is the difficulty of varying the rate of feed across the disc. While this is not impossible with this type of unit, it certainly calls for additional refinements which can add greatly to the cost. The desirability of being able to vary the rate of feed and thereby secure different lines per inch of the resulting spiral will be mentioned later, but for the moment it can be accepted that for full versatility, and to a certain extent for economy in disc consumption, it is a desirable feature.

The second type of traversing mechanism, which is by far the most popular with both professional and amateur recordists, employs a lead-screw similar to that of a lathe, and is entirely located above the turntable. In its most usual form, it is arranged to straddle the turntable between mounting posts located on the baseboard, but other arrangements are known where it is placed on one side so as to leave the disc quite clear of mechanism.

The cutting head is mounted on a carriage which can ride on rails across the surface of the disc, and is controlled in this respect by the leadscrew, which is driven through a gear train from either the centre spindle or the turntable rim. In certain cases the carriage rails may be made similar to those on a precision lathe, but in less ambitious set-ups they may be simplified down to a single rod of circular cross-section with sliding sleeves to support the carriage. The criterion in either case is obviously to ensure that the motion is easy-running without binding or undue looseness which could bring about minor irregularities in the spiral track. For convenience in operating, means are usually provided for enabling the motion from the leadscrew to be connected at will to the carriage by means of a half-nut or similar device.

With this type of mechanism, certain refinements which can add to the versatility of the equipment can be more readily introduced than with the first-named type. One of these is a means of reversing the direction of advance of the carriage relative to the motion of the turntable, so that the commencement of the spiral can be located at the outside edge of the disc (Outside-In cutting), or close to the centre (Inside-Out cutting). The relative merits of these alternatives will be discussed later in this series.

Another refinement which is not altogether necessary, but which is often preferred by professional recordists, is a means of providing a rapid-spiral feed. An instance where this may be used can be seen on commercial recordings for the operation of automatic record-changing mechanisms. Another use is when several recorded bands are cut on the same disc and it is desired that they can be reproduced either separately or consecutively. A



distinct break of about 1/8 inch can be readily made between each band if a quick-sparring feed is provided, so that each can be quickly selected when playing back, while continuous playing across the disc is still possible if so desired. The usual way in which a rapid-spiral feed is obtained is to provide a "free-wheel" or slipping clutch mechanism in the gear train to the leadscrew, which can be advanced by a handwheel to provide rapid feed.

A word should now be added with regard to possible faults in the traversing mechanism in order to provide a guide when designing or selecting a unit. The uniform nature of the spiral in a commercial recording is a noteworthy feature to be remembered by all who would undertake this work for themselves, and it is in this respect that the first and most common fault in traversing mechanisms is found. Irregularities in the rate of feed bring about irregularities in the spacing of consecutive grooves, and this fault is generally spoken of as "Twinning." Should it be periodic in character, and occurring only at evenly spaced intervals, it is sometimes known as "Banding." In either case it is a mechanical fault in the system which requires to be eliminated before satisfactory recording is possible, as the effect is to seriously limit the peak amplitudes of the signal which can be engraved without cutting over to the adjacent grooves. Such a limitation can also impair the resulting signal-noise ratio during subsequent reproduction. Causes can be either faulty design or workmanship, or poor adjustment. It must be remembered that the mechanism must move freely but without undue slackness, and it is wise to make all bearings and sliding surfaces adjustable in this respect. It will be found that leadscrews are best mounted between ball or pointed centres, rather than in sleeve bearings which require considerable precision in their manufacture in order to be satisfactory.

Minor variations in the pitch of the leadscrew are inevitable unless it has been precision-ground, and these will be reflected in the resulting spiral on the disc. As a point of practical interest, it has been found preferable to use a leadscrew of rather coarse pitch, and to employ a greater gear reduction from the turntable in order to secure the required spiral groove pitch, rather than to gain the same result with a fine-pitch leadscrew and less gear reduction. The reason for this is twofold. The minor variations when cutting a coarse leadscrew are likely to be a smaller percentage error of the nominal pitch than with a fine pitch, and secondly, the "gear hum" from the reduction gears is likely to be much less with the smaller and more numerous teeth associated with larger gear ratios. Thus for a desired spiral of about 100 lines per inch, it will be preferable to use a gear ratio of 10:1 with a 10 T.P.I. leadscrew, rather than a ratio of 3:1 with a 33.3 T.P.I. leadscrew.

There is one minor disadvantage of a coarse leadscrew however, which should be mentioned in passing, and that is the inability to quickly commence cutting at any given point on the disc. With a fine screw, the half-nut can be quickly engaged with an appropriate thread because of its comparatively fast rate of rotation, whereas the coarser and slower turning screw will take longer to permit engagement to be made, but it is generally considered that the advantages of a coarse thread far outweigh this disadvantage.

The profile of the leadscrew thread is a matter of some importance also, particularly where the carriage mechanism requires an appreciable force to move it. The familiar Whitworth thread can bring about "twinning" when a half-nut is employed unless a heavy engagement pressure is used. Due to the inclined nature of the thread faces, there is a tendency for the half-nut to "climb" them and disengage itself if the axial thrust is at all high, and even if absolute disengagement is not brought about, and small "climbing" will introduce "twinning." For this reason, square thread profiles are to be pre-

ferred, and the half-nut can be simplified down to a single tongue which can engage with the threads. It is unfortunate that square thread profiles do not lend themselves to precision grinding as readily as do those of a Whitworth nature, and it usually becomes necessary to content oneself with a lathe-cut job. However the observant enquirer will examine carefully the sides of the thread to ensure that no "chatter marks" or other surface irregularities are present to an excessive degree, in which case there should be no cause for apprehension when it is put to work.

In recent years, a number of commercially-built traversing mechanisms which conform fairly well to the specifications given above has appeared on the Australian market, and it is probable that only the most ambitious recordists will prefer to build their own units. However the above remarks will serve as a guide towards the selection of a particular make.

The principal mechanical aspects of a recording machine have now been reviewed, and succeeding articles in this series will be devoted more to the electrical and manipulative sides of the art. Before concluding this chapter, however, a few words should be added regarding the manner in which the cutting head should be attached to the carriage of the traversing mechanism. This will necessarily depend upon the type of cutting head employed, but generally speaking, it must be capable of permitting some movement in a vertical direction to allow for minor variations in the flatness of the disc being recorded. This feature is most conveniently provided by means of a hinged connection between carriage and cutter which can be adjusted to give free motion with the minimum of backlash. The height at which this hinge lies above the record surface is important, and should not be too great, as a tendency for the cutting head to bounce when recording is likely to be then present. Experience shows that best results are obtained for heights not exceeding that of the centre of the cutting head above the disc, although experiment may reveal an optimum position for any particular head.

The residual stylus pressure required for instantaneous recording on Cellulose Nitrate and similar materials is in the region of 50 to 60 grams, and as the weight of the majority of cutting heads exceeds this figure, it is necessary to provide a means of counterbalancing, either with an adjustable tension spring or a counterweight. The particular choice of the method for so doing is usually determined by the space available for raising the head clear of the disc.

The movement provided by the hinge should be large enough to permit the head to be raised well clear of the disc and enable the ready changing of cutting styli, and for safety, some form of cam-operated device should be included so that the head can be locked in the raised position, and gently lowered into contact with the recording disc.

The angle at which the stylus meets the surface of the disc is important, and as will be seen later, is close to 90 degrees. It is necessary therefore to include some form of adjustment in this connection, either by means of a special clamping device, or by providing means of raising or lowering the hinge relative to the record surface. Needless to say, the stylus should also be perpendicular to the disc surface when viewed from the front of the cutting head.

Theoretical considerations show that the stylus should travel along a true radius of the recording disc, but in practice it will be found advantageous to advance it slightly forward of this position in order to cause the thread to throw itself clear of the groove when it is cut, and thus avoid tangling itself round the stylus. The amount of advance varies from 1/8 to 3/8 of an inch, depending on the largest diameter of the disc being recorded.



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# SOUTH AUSTRALIAN DIVISION

## ANNUAL REPORT

Presented to the Annual Meeting of the Wireless Institute of Australia, South Australian Division, 11th June, 1946.

Gentlemen,

It is my privilege and pleasure to present to you tonight a report for the period from the date of the re-formation of the Institute in July last to date. That period has been a momentous one both for the Institute and for Amateur Radio as a whole, for it has seen the former revitalised with an enthusiasm among members which must at least be equal to anything shown in the past. It has also seen the return of the Amateurs of this and many other countries to the air; although to date we have only the use of a few and restricted bands of frequency this may not be an unmixed blessing, in as much as it will have given many the experience of 28 M.C.s. which they would not otherwise have gained. It has shown them that attention to details in both receivers and transmitters is necessary, which was not so essential on the lower frequencies on which they had previously worked. They will find, however, that similar care when they do return to the lower frequencies will pay dividends. The importance of aerials, too, has been more forcibly demonstrated.

Although the amateurs of some countries, notably Great Britain, have returned to the air under much more liberal regulations than in pre-war days, we find that our Government has seen fit to impose on us restrictions which we had not previously suffered, and has entirely debarred us from certain avenues of experimentation, such as frequency modulation, television and pulse transmission. Some of the restrictions, such as the ban on "canned music," meet with the approval of the majority of us, but others including the qualifying age and the two classes of licence do not, and we are, through our Federal Executive, registering our protests in the hope that we may secure alterations which will put us on a footing with the amateurs of countries whose governments have not imposed such restrictive regulations.

I would like to trace very briefly the history of this Division of the Institute from its re-formation. As most of you are aware, the South Australian Division of the Wireless Institute had, during the war years, ceased to function as an organised body, although a few stalwarts kept some contact with Federal Headquarters. This was mainly due to the fact that the vast majority of those amateurs who were not directly serving in the Forces were so fully occupied in work either directly or indirectly connected with the war that they had no time to keep the Institute going. One wartime activity of members of the Institute, if not of the Institute itself, was the formation of an A.R.P. Wireless Communication Network. This, although formed somewhat late in the piece, nevertheless became a very active and efficient organisation with stations at Adelaide, Prospect, Norwood, Thebarton, Unley, Woodville and Glenelg, the headquarters station at Adelaide working on a frequency of 1775 K.C., the outstations on 3605 K.C., carrying out by weekly tests. These stations were maintained with the personnel of approximately 30. The organisation had as its controller the late Mr. H. W. Harrington, Superintendent of Wireless, and as deputies Mr. Jack De Cure, Radio Inspector, and Mr. E. A. Barbier, our Secretary. Fortunately, like other branches of A.R.P., this one never had to go into action, but it would undoubtedly

have given a very good account of itself had it been necessary for it to do so.

Towards the middle of last year, when it was obvious that hostilities were going to end, a number of amateurs considered it was time to get the Institute moving again and a meeting was called for 18th July, which, to the gratification of the sponsors, was attended by about 43 interested people. The meeting was an enthusiastic one, and it was unanimously decided to reform. A committee was appointed and began to work immediately in a spirit of enthusiasm. You will appreciate that they faced a big task. The funds available from pre-war days amounted to 10/3, and practically no stocks of stationery or other requirements were on hand, while accommodation for meetings was at a premium. However, after considerable search a room was secured at 17 Waymouth Street, and a general meeting was held on the 14th of August, with an attendance of about 60, and a council was elected, followed by a lecture on transmission of pictures by radio and wire by Mr. Jack De Cure. The Council held its first meeting on 21st August, at which the various officers were appointed, and as the Council consisted chiefly of members of the original committee they were able to swing into action immediately. Many important items were given priority, such as the establishment of full contact with Federal Headquarters, the appointment of a committee to draw up the constitution, etc., etc. It was, I consider, an outstanding achievement that an A.O.P.C. class with 19 members should have been started only two months after the first general meeting. Since the first meeting in August we have had a general meeting each month, at which a lecturer has been provided, with the exception of the September meeting, when we visited the R.A.A.F. school; December, when we had a most successful Christmas social; and May, when due to the fact that our meeting room was not available we accepted the offer of the Vacuum Oil Company to provide a picture night for us. Since the inaugural meeting our membership has shown a remarkable growth; from 43 who attended that meeting we have grown to a strength of over 200, by the end of May. A feature has been the wonderful attendance at meetings, which reached its peak at the April meeting when, from a total membership at that time of approximately 180, which of course includes country members, we had an attendance of 113. These large attendances have been most welcome and gratifying, but have been almost an embarrassment to the Council in as much as that the room secured for meetings, which it was thought would see us through the first twelve months, soon proved totally inadequate, and we had to look for a larger one. We were fortunate in securing one in the same building, but it looks as if we shall have to ask the owners to buy more chairs and instal elastic sides. However, we still hope to see the attendance grow, and if the time comes when it is necessary, we shall even book the town hall.

I would now like to deal in more detail with some of our activities.

**A.O.P.C. Classes.**—As I have already mentioned, these were inaugurated within two months of our first meeting, with a roll call of 19. Those 19 members as well as the Council are deeply grateful to Mr. Roy Buckenfield and Mr. Harry Roberts, who conducted the theory and code classes respectively. A number of these students presented themselves for the examination in May. We

understand that the results of the exam. are out, but I am, unfortunately, unable to secure much information as to how our candidates fared, beyond the fact that one member of the class secured 87 per cent. of his theory paper, and will be given an opportunity to re-take his code test at the next examination. The second A.O.P.C. class with 16 students is well under way with Mr. Askins conducting the theory and Mr. Roberts again giving code instruction.

**Technical Committee.**—This was formed early in our activities, and is composed of some of the best technical brains of the Institute. Their help and advice is available to any member who desires it. Members of the committee will welcome any approach either directly or through the Secretary. The committee comprises Messrs. McGrath, Brown, Buckenfield, Wreford and Al. Smyth.

**Trade.**—Another early move by the Council was an approach to the Trade for price concessions. As a result of this members who hold a station licence are now supplied at dealers' prices, while other members receive a concession of 10 per cent. from the leading houses in the trade. This, I think, is a privilege not previously obtained by the Institute for its members, and one which should be appreciated. While many of our members undoubtedly obtained price concessions in certain quarters in the past, these did not accrue to members generally by virtue of their membership.

**Identity Plaques.**—These were introduced some months ago and members are finding them very useful in identifying and getting to know one another at meetings. Since they are retained between meetings by our mem-

bership organiser, members do not arrive at meetings and find that their plaques are in another suit.

**Lecturers.**—We have been indebted during the period under review to the following for having provided lectures or other interest at our monthly meetings; Messrs. J. De Cure, David Cox, Al Smyth, Morrie Phillips, Merv. Brown, Reg. Davies, John Allen, Mr. Gill (Headmaster, School of Mines, R.A.A.F. School), and the Vacuum Oil Company for a picture night. To each we tender our thanks.

**Trophies and Donations.**—We are also indebted to the local branch of the I.R.E. for a donation, and to Messrs. Bob Bruce and Frank Miller for offers of trophies for contests. It is hoped to announce details of these at an early date. In arranging these the Council is bearing in mind the advisability of encouraging activity on the ultra-high frequencies. We also place on record our thanks to the Camera Club for granting us the use of a room for Council Meetings.

**Experimental Advisory Committee.**—This has been formed by the Wireless Branch of the P.M.G.'s Department under the new regulations, and takes the place of the old vigilance committee. Under the chairmanship of a Radio Inspector it comprises three nominees of our Institute and three others appointed by the Superintendent of Wireless. It is felt that some of our members have a wrong idea of this committee, and have some distrust of those of our members who serve on it. The view to take is that the committee is working in the interests of amateurs as a whole, and not as a watchdog for the Department. We should all, as decent citizens, be prepared to abide by the regulations which



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govern us, even if we do not entirely agree with them all. It is in the interests of us all that only signals of decent quality and subject matter should be permitted to go on the air, and we should be prepared to assist in suppressing poor signals or doubtful subject matter. There is so much listening on short wave by the general public in these days that a few irresponsibles could quite easily give a bad name to all amateurs. On the other hand, if any of us should unwittingly put out a poor signal, or otherwise contravene the regulations, it is much nicer to receive a tip from the advisory committee than an official notice from the Department. The feeling should be that the committee is there to assist and advise us if necessary, and we should look on it as a friendly body and not as an espionage system. At present the committee consists of Mr. Cec. Pike (Chairman, Messrs. Warwick Parsons, Launce Deane, and E. A. Barbier—Institute nominees—and Messrs. Ralph Turner and A. L. Saunders—non-W.I.A. Members.

**Ionospheric Charts.**—The Council some time ago arranged with the C.S.I.R. to send up these their monthly bulletins, and we now receive them regularly. We are deeply grateful to Mr. John Allen for interpreting these for us, and we have made a start on having them published regularly in our notes in the press. The Council trusts that members will find this service useful as an aid to determining the possibilities of D.X. They will become even more useful when the lower frequency bands are returned to us.

**Constitution.**—This has been drafted and under review for some months, and will be submitted to you to-night for approval. Much thought and a considerable amount of work has gone into this, and it is hoped that it will be accepted in the form in which it will be presented.

**Incorporation.**—It has been my ambition to see this annual meeting as that of an incorporated body, and we have been working to that end. However, it was decided that the Federal Convention should discuss the adoption of a standard constitution for all divisions, and we feel in view of this that it would be foolish to push on with our incorporation only to have to alter our constitution in a few months. This would cost money, and we have therefore decided to withhold incorporation until we have seen whether unanimity can be achieved throughout all divisions. We feel that there should be a common constitution, and that membership of one division should be in all respects on the same footing as all other divisions. The Convention decided that each division should examine the subject, and we feel, therefore, reluctantly compelled to defer the matter of our incorporation until we know the views of other divisions.

**Magazine.**—Our official organ, "Amateur Radio," is now being received regularly by all financial members at no cost beyond their annual subscription. I think you will agree that for an all-amateur effort it is worthy of the very highest praise. We offer our thanks to the energetic committee for producing it and to the Victorian division for sponsoring it and bearing a financial loss thereby over a number of years. I have made regular appeals at monthly meetings for articles suitable for publication in this paper, but regret that up to date the response has not been overwhelming. I do again appeal to any and all members who can do so to support the committee with articles and other matter suitable for publication. I record the Council's appreciation of Mr. Frank Wreford's efforts in contributing the monthly notes from this division, and I think we can claim that they will stand comparison with those from any other division.

**Federal Executive.**—I desire to express to the members of the Federal Executive our appreciation of their work on our behalf. We know that they have been left with a legacy of work as a result of the recent Federal Convention, but it is our hope and trust that they will carry the various matters entrusted to them

to a successful conclusion. They are assured of our continued and fullest support. When in Melbourne last week I had the pleasure of meeting the majority of the members of this executive, and I can assure you that in them we have a live and enthusiastic body who will energetically carry out the instructions of the divisions, which, as they realise, is their main function. Our worthy Secretary has been appointed as our representative to the Federal Council.

**Convention.**—I think most of you are aware that the Federal Convention was held in Melbourne over the Easter period, and we were fortunate to be so ably represented by Mr. Barbier. As he is due to give you his own report later in the evening I do not intend to go into details on this subject, but would like to thank him for having represented us so well, and to say from the report which he has already presented to Council that we may expect a lot of good things as the outcome.

**Instrument Library.**—It is the aim of the Council to establish as soon as funds and facilities are available a library of instruments which will be of use to members. I am pleased to inform you that the first instalment of this is already purchased—a reliable frequency meter, of well-known American make, and from this it is anticipated that members will be able to obtain calibrations for their own meters to an accuracy of 1 K.C. or better. The instrument has just come to hand, and we expect to make a further announcement at an early date.

**General.**—During the period covered by this report the Institute has lost by death two old friends. The first was our late member Al Reimann, VK5JO, who held various offices and took an active interest in the Institute over a number of years, and was a regular attendant at meetings from the time we reformed to the

(Continued on Page 26)

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## NEW TUBES

From Amalgamated Wireless Valve Company comes the news that supplies of the new locally made miniature 1.4 volt valves, types 1R5, 1S4, 1T4, 3Q4 (see footnote) and 3S4, together with the range of single ended A.C. types 6SA7-GT, 6SF7-GT, 6SJ7-GT, 6SQ7-GT, and 6SK7-GT are expected to be available almost immediately. From another source it is learned that high quality sockets for the miniature tubes are shortly expected to be available in all States.

A.W.V. advises that the American Fire Underwriters have refused to approve type 3Q4 for use in battery/mains receivers, owing to the special pin connections with two pins connected to the plate, which if the valve was inserted in the wrong socket, might be dangerous to the user. As a result, R.C.A. have announced type 3V4 which is electrically similar to the 3Q4, but has different pin connections. Local production will therefore change over to type 3V4, and type 3Q4 will be deleted.

### RADIOTRON 7193 (2C22)

Radiotron 7193 (2C22) is an Australian made VHF triode with the plate and grid connections brought out through the top of the bulb.

It is capable of being used as an oscillator or amplifier at frequencies as high as 300 Mc/s. Physically it is slightly smaller than type 1A7-GT, but it may be used on plate voltages of 300 volts (CCS) and 500 volts (ICAS) with a plate dissipation of 3.3 watts for both ratings. A useful output is obtained up to about 250 Mc., whilst the resonant frequency of the input circuit is 335 Mc.

### RADIOTRON 7193 (2C22) CHARACTERISTICS

#### \*Heater, Coated unipotential cathode—

Voltage (A.C. or D.C.) ..... 6.3

Amperes ..... 0.3

#### †Direct interelectrode capacitances—

Grid to Plate ..... 3.6 uufd.

Grid to Cathode ..... 2.2 uufd.

Plate to Cathode ..... 0.7 uufd.

Overall Length ..... 3-1/8 inches

Seated Height ..... 2-9/16 inches

Maximum Diameter ..... 1-5/16 inches

Bulb ..... T9

Caps (two) ..... Skirted Miniature

Base ..... Intermediate Shell Octal 8 Pin

Pin 1 ..... No Connection

Pin 2 ..... Heater

Pin 3 ..... No Connection

Pin 4 ..... No Connection

Pin 5 ..... No Connection

Pin 6 ..... No Connection

Pin 7 ..... Heater

Pin 8 ..... Cathode

Cap above Pins 1 and 8 ..... Plate

Cap above Pins 4 and 5 ..... Grid

Mounting Position ..... Any

### CHARACTERISTICS TYPE 7193 (2C22) AS AMPLIFIER

†Plate Voltage ..... 300 max. Volts

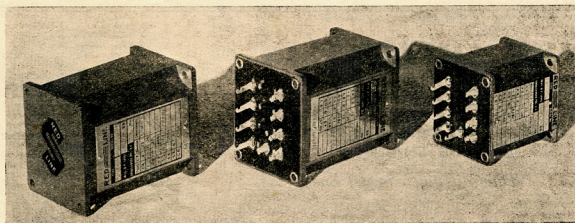
Plate Dissipation ..... 3.3 max. Watts

#### AS CLASS A<sub>1</sub> AMPLIFIER

Plate Voltage ..... 300 Volts

‡Grid Voltage ..... -10.5 Volts

Amplification Factor ..... 20



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Plate Resistance	6,600 Ohms
Transconductance	3,000 Umhos
Plate Current	11 m.a.

\*In circuits where the cathode is not directly connected to the heater, the potential difference between heater and cathode must be kept as low as possible.

†With no external shield.

‡This value is for Continuous Commercial Service (CCS). In intermittent Commercial and Amateur Service (ICAS) the plate voltage may be as high as 500 volts max., but the maximum plate dissipation remains unchanged.

§Under maximum rated conditions the resistance in the grid circuit must not exceed 1 megohm.

The approximate resonant frequency of the input (grid-cathode) circuit is 335 Mc.

#### RADIOTRON TYPE AV11, HIGH VOLTAGE RECTIFIER

Radiotron type AV11 is a special war-time emergency type of high voltage rectifier with higher current carrying capacity than any other in its group.

Although manufacture has been discontinued large stocks are at present held.

##### REVISED RATINGS TYPE AV11

Filament Voltage	2.5 Volts
Filament Current	1.75 Amps.
Maximum Overall Length	5½ Inches
Maximum Diameter	2-1/16 Inches
Bulb	ST16
Base	Medium 4 Pin
Pin 1	Filament
Pin 2	No Connection
Pin 3	No Connection
Pin 4	Filament
Cap	Plate

##### MAXIMUM RATINGS

Peak Inverse Voltage	12,500 volts
Peak Plate Current	200 m.a.
Average Plate Current (D.C.)	20 m.a.

#### HYTRON TYPE 2E30

##### Miniature Instant-Heating Beam Tetrode (Development Type HD59)

The Hytron type 2E30 is a filamentary type of beam tetrode designed for use in higher frequency mobile equipment as a Class A1 audio frequency amplifier, Class AB2 modulator, Class C oscillator, neutralised Class C amplifier, and Class C frequency multiplier in those applications where it is desired to eliminate filament drain during standby period. The oxide coated filament of the 2E30 comes to operating temperature in approximately one second.

##### Tentative Data

##### GENERAL CHARACTERISTICS

*Filament	Oxide coated
Potential A.C. or D.C.	6 volts + or - 10%
Current	0.7 amperes
Transconductance for Ib = 40 m.a.	3400 umhos
Amplification factor G1 to G2	6.8
Direct interelectrode cap. (without external shield):	
Grid to plate	0.5 max. uufd.
Input	10 uufd.
Output	4.5 uufd.
Maximum overall length	2-5/8 inch
Effective bulb length (hold-down height)	2-3/32 inch
Maximum diameter	3/4 inch
Bulb	T-5½
Base	miniature button 7-pin
Mounting position	filament plane must be vertical

Beam plates should be connected directly to ground or filament centre tap. In VHF circuits the centre tap should be by-passed to or grounded to a common point to provide lowest effective filament inductance.

##### A.F. POWER AMPLIFIER—CLASS A1

Maximum Ratings, Design-Centre Values

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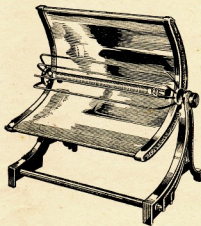
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- \* Wait for Performance Details of the New "504" Eddystone Communications Receiver. It is THE Tops.

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51 WILLIAM STREET, MELBOURNE. (MU 1110)

R. H. CUNNINGHAM (VK3ML) MANAGER.

D.C. plate potential	250	max.	volts
D.C. screen grid potential	250	max.	volts
D.C. plate input power	10	max.	watts
D.C. screen grid input power (max. signal)	2.5	max.	watts
Plate dissipation	10	max.	watts
Typical Operation—Average Characteristics			
A.C. filament potential*	6.0		volts
D.C. plate potential	250		volts
D.C. screen grid potential	250		volts
D.C. control grid potential† (a)	—21		volts
	450		ohms
Peak A.F. control grid potent.	17		volts
Zero signal D.C. plate current	40		m.a.
Max. signal D.C. plate current	44		m.a.
Zero sig. D.C. screen current	3		m.a.
Max. sig. D.C. screen current	9		m.a.
Load resistance	4,500		ohms
Max. signal plate power output	4		watts
Harmonic distortion	10%		

### R.F. POWER AMPLIFIER AND OSCILLATOR CLASS C TELEGRAPHY AND FREQUENCY

#### MODULATION

Key down conditions per tube without amplitude mod.

Maximum Ratings, Absolute Values			
D.C. plate potential	250	max.	volts
D.C. screen grid potential	250	max.	volts
D.C. control grid potential	—150	max.	volts
Control grid resistor	100,000	max.	ohms
D.C. plate current	60	max.	m.a.
D.C. control grid current	3	max.	m.a.
D.C. plate input power	15	max.	watts
D.C. screen grid input power	2.5	max.	watts
Plate dissipation	10	max.	watts

Typical Operation—Class C Oscillator—Average Characteristics

D.C. plate potential	250	volts
----------------------	-----	-------

D.C. screen grid potential	250	volts
D.C. control grid potential† (a)	—60	volts
	(b) 75,000	ohms
Peak R.F. control grid potent.	85	volts
D.C. plate current	55	m.a.
D.C. screen grid current	9	m.a.
D.C. control grid current	0.8	m.a.
Control grid driving power (including bias loss)	0.07 approx.	watts
Power output (useful)	7.5 approx.	watts
Typical Operation—Class C Doubler (40 to 80 Mc.)		
D.C. plate potential	250	volts
D.C. screen grid potential	250	volts
D.C. control grid potential† (a)	—80	volts
	(b) 100,000	ohms
Peak R.F. control grid potent.	165	volts
D.C. plate current	55	m.a.
D.C. screen grid current	8	m.a.
D.C. control grid current	0.8	m.a.
Control grid driving power (including bias loss)	0.1 approx.	watts
Power output (useful)	4.5 approx.	watts
Typical Operation—Class C Doubler (80 to 160 Mc.)		
D.C. plate potential	250	volts
D.C. screen grid potential	140	volts
D.C. control grid potential† (a)	—125	volts
	(b) 70,000	ohms
Peak R.F. control grid potent.	165	volts
D.C. plate current	45	m.a.
D.C. screen grid current	5	m.a.
D.C. control grid current	1.8	m.a.
Control grid driving power (including bias loss)	0.3 approx.	watts
Power output (useful)	3 approx.	watts

#### NOTES

\* Switching of the filament with plate and screen potentials applied may result in damage to the 2E30.  
(Continued on Page 25)

## PROPAGATION PREDICTIONS FOR JULY.

The following predictions for the month of July are condensed from the Radio Propagation Bulletin (A.R.P.C. A19), published by the Radio Research Board for the Australian Radio Propagation Committee. Copies of the Bulletin are available from all newsgroups and book-sellers. Enquiries regarding any of the publications issued by the Committee should be addressed to the Secretary, Australian Radio Propagation Committee, Radio Research Board, University of Sydney, N.S.W.

**Zone E.—Latitude 10 degrees South—(Nth Queensland, Northern Territory, Nth. Western Australia):—**

28 Mc. is useable for skip distances of 2,500 miles, from 0800 to 1600 hours, local time at point of reflection. These predictions are made with the understanding that the reflection point is in Zone E between latitude 5 degrees South and latitude 15 degrees South.

**Zone E covers all the area contained between longitude 30 degrees East and 180 degrees East. This includes Australia, Asia (including the Netherlands Indies, Thailand, Malaya, Burma, China, Japan, The U.S.S.R., India, and portion of Arabia).**

**Zone E.—Latitude 20 degrees South—(Southern Queensland, New South Wales, South Australia, Western Australia):—**

Between 0930 and 1600 hours local time at point of reflection 28 Mc. should be useable for skip of 2,500 miles. For shorter skip distances (1,800-2,000 miles) 28 Mc. is useable between 1030 and 1500 hours.

Reflection point should be in Zone E between latitude 15 degrees South and 25 degrees South.

**Zone E.—Latitude 30 degrees South—(Victoria, Southern New South Wales, Southern South Australia, and Southern Western Australia):—**

Conditions on 28 Mc. in this Zone appear to be deteriorating rapidly. According to the chart published in the Bulletin the maximum useable frequency is 27 Mc. This may explain the reports from Amateurs in New South Wales that a decline on 28 Mc. has set in.

**Zone E.—Latitude 40 degrees South—(Tasmania):—**

Conditions in this Zone are not conducive to long distance working. The maximum useable frequency given is 24 Mc. which is 2 Mc. lower than last month.

Generally speaking it appears that 28 Mc. is gradually becoming less suitable for DX working, and possibly before long will suffer a complete fadeout.

## IN REVIEW

This month sees the welcome re-appearance of an old friend in its new post-war dress, I refer to the popular Amalgamated Wireless Valve Company's publication "Radiotronics." This publication has been vastly improved and is now more comprehensive than ever. An indication of the service that subscribers to "Radiotronics" can expect can be had from the introductory paragraphs to this issue (No. 117). Quote "The last issue of 'Radiotronics' was in September/October 1941, but we are happy once more to greet our readers and hope that from now on the issues of 'Radiotronics' will continue regularly and will prove even more interesting.

"During the past few months, pending the re-introduction of 'Radiotronics' in its proper form, four issues of a small four-page 'Radiotronics Digest' have been made. Some technical data were given in addition to matters of general sales interest, but these were intended only to bridge the gap until circumstances permitted the resumption of 'Radiotronics'.

"Opportunity has been taken to re-arrange the material in 'Radiotronics' so as to assist the reader in finding the items which interest him most. In the normal issue there will be a DESIGN SECTION, which will deal with the detailed design of receivers and amplifiers, giving the reasons for the choice of circuit constants, and curves showing the detailed performance.

"This will be followed by a CIRCUIT SECTION in which (except for this issue) will appear the circuit diagram and such explanatory notes as are needed by the ordinary person who may not be interested in the full technical details of design. These will be arranged with one circuit on each page so that they may be reprinted in leaflet form to meet subsequent inquiries.

"The third section deals with GENERAL THEORY, and as far as possible the material will be arranged to include both elementary and advanced articles including items of general interest.

"The final section will deal with VALVE DATA and will give information on new valve types and particular points in connection with existing types of valves which may not otherwise be available.

"In each issue of 'Radiotronics' it is planned to include a loose leaf supplement in the form of 'Radiotron Service Digest' which will include such matters as the availability, prices and announcements of valve types, sales aids and advertising, followed by a section for Servicemen covering valve testing, faults and their identification, and the replacement of types in short supply by their nearest Australian equivalents."

Included in the current issue are the following articles and information. "Radiotron Receiver RC 52," which is a six valve dual wave receiver using the new single ended series type valves shortly to be released in this country by A.W.V.

"Radio Frequency High Voltage Sources," which is an article describing a method of producing high voltage supplies for Cathode Ray Tube operation.

(Continued on Page 25)

## BRIGHT STAR RADIO VK 3UH

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Phone: Private UL 5545 or Business UL 5510



Crystals accurately ground to your  
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Mounted in holder to fit Octol

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Plug-in Holders, Bakelite, . . 7/6 and 12/6

455 Kc., 1000 Kc, and 100 Kc Crystals also  
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## ON THE HIGHS

Although these notes have been appearing for the last two months VK's 3YP and 3CP are still mainly responsible for the compiling of the notes. This month however a few short paragraphs have been cut from Divisional notes for inclusion under this heading.

It is desired that these notes should be representative of all States, and it is up to all readers to forward some of their and others doings on the high frequencies . . . Editor.

### 28-29 MEGACYCLES

Conditions on ten metres towards the end of this month (June) have taken a turn for the better, for the Europeans are showing up again at the usual time, that is around 7 p.m. in Victoria. Several, however, have been worked at 3YP at 8.15 a.m. This is with the beam on South America giving the contacts the longest possible path.

Taking the month as a whole, the daylight hours have been very favourable and the United States have been consistent from 7 a.m. until 3 p.m.; South Americans from 8 a.m. until 9 a.m. and again round about 11 a.m.; Asian and Oceania at all hours of the day and some VK's have even worked all Australian States in a few hours.

There are many interesting contacts to be had with chaps in the Islands of the Pacific and VR2AB, at Fiji, puts in a beautiful signal from 15 watts to a 3 element beam.

New South Wales reports that the conditions on 28 Mc. show a steady decline, and from their point of view it looks as though it will be next spring before the DX becomes easy to work again. Short skip has been noticeable during the day and the ZL's, VK's and even occasional VK4's and 3's bob up at near maximum strength, stay for an hour and disappear quickly.

The majority of fellows are now using the famous 3 element beam for both transmitting and receiving and if the driven element is a folded dipole fed by co-ax cable, the tuning is quite broad and the beam is good for a frequency range of 250 kc. either side of the peaked frequency.

Some of the constant signals from the States however, use just a half wave dipole. One of the best using this setup is WSKJB who has his dipole 110 feet high on top of an old oil derrick.

For those interested around Melbourne VK3IP at Fern-tree Gully makes quite a good contact for beam rotation tests. VK3BW at Port Arlington is also always ready to help.

VP9F from (Beautiful) Bermuda has good fone and is easy to contact on 28120 kc. The best from Mexico is XEIAM; South America, Colombia HK1HB cw 28010, HK3AB fone 27999; Chile CE1AH fone 28700, Venezuela YV5ABX fone 28110; Trinidad VP4TK fone 28050; Curacao PJ3X cw 28000; Central America and West Indies W8LZK/NY4 mobile around the Cuba Navy Dock Yards; Canal Zone KZ5AA cw 28050; Barbados VP6YB fone 28090; Puerto Rico K4ESH cw 28050, KZ5AB cw 28100, KP4AZ cw 28040. From Guatemala TG9RC, TG9PB fone 28100, TG9FG fone 28160, TG9JW fone 28500; Antigua VP2AP fone 28200; Costa Rica TI2RC, TI2AW fone 28220.

To move over to Asia PK4DA puts through some of the best fone and uses a Y 4 waves in phase antenna with 40 watts. He has now left for home in Holland and hopes to be able to take with him his HQ120 receiver. Korea boasts of AK1LO fone 28600; OQ2AC cw from Lebanon on 28090; VS1BA and VS1BD from Singapore with fone on 28400 and 28350; EQ3W fone on 28300 from Adaban, Persia; with VU2BG in India putting in the best cw.

Europe has PA0UN cw 28020, PA0NW cw 28050, PA0IN cw 28050, F8USA 28000 coming through around 8 a.m. E.S.T. Africa produces ZS's by the dozen as well as a few ZE's; VQ2FP 28040, VQ2PL 28120 fone, ET6MI (old VQ6MI) on 28080, ZD4AR 28590 with good fone from the Gold Coast.

VK2AJX reports hearing an SV round about 5 p.m. and promptly worked him, VK5NR in the Northern Territory was recently heard working VS9MP.

### 50-54 MEGACYCLES

It seems that with the falling off of conditions on ten more and more of the gang are graduating to "six." In N.S.W. those reported active on this band are VK2's NO, LS, ABS, ZN, WJ, CP, NP, AFO. VK2AFO is located in the valley between Katoomba and Leura and yet his signals radiated from an indoor antenna come in R7/8 in Sydney. VK2LS has gone away for a month's trip in the country and took with him a 50 Mc. receiver, so he may have some interesting reports for the local boys when he returns.

VK3MJ, VK2NO, and VK3AFQ have test sked with New Zealand each week-end, but so far no results are reported. ZL1JJ listens regularly on 50-54 Mc.

In VK3 many are operating on the band but up to date very little of their doings have reached y Editor.

VK4 report that at last there is some activity on this band, VK4RY and VK4ZU making his first contacts on the 16th June. At 4RY the rig is a 6V6 xtal, 6N7 tripler, 807 doubler and an 807 in the final. The line up at 4ZU is a 6V6 xtal, 6L6 tripler, 6L6 doubler and 807 final, modulated by 6L6's. VK4RC, VK4EL and VK4AW are threatening to join the gang.

### 166-170 MEGACYCLES

There seems to be very little activity on this band, only one report of activity has been received. However certain members of VK3 intend to break into the band in a big way. With many of the high frequency tubes becoming more readily available it should not be hard to put a really stable rig on 166.

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VK3RJ R. E. JONES, QSL MANAGER

The following addresses of Dominion and Foreign QSL Bureaux and Managers have come to hand:—

Great Britain—R.S.G.B., 28-30 Little Russell Street, London, W.C.1, England.

New Zealand—N.Z.A.R.T., Box 489, Wellington, New Zealand.

Norway—N.R.R.L., Ernst Firing, LA60, Bentzebrogt 29, Oslo, Norway.

France—R.E.F., 1 Rue des Tanneries, Paris 13e, France.

U.S.A., W1—W1BGY, Jules Steiger, 231 Meadow Street, Willimansett, Mass.

W2—W2SN, H. W. Yahnel, Lake Ave, Helmetta, N.J.

W3—W3WU, Maurice Downs, 1311 Sheridan Street N.W., Washington, D.C.

W4—W4MS, E. J. Collins, 1215 Nth. 12th Ave, Pensacola, Fla.

W6—W6TI, Horace Greer, 414 Fairmount Ave., Oakland, Calif.

W7—W7DXZ, Frank E. Pratt, 5023 S. Ferry, Tacoma, Wash.

W8—W8GER, F. W. Allen, 324 Richmond Ave., Dayton, Ohio.

W9—W9HLF, F. Moore, 1024 Henrietta Street, Pekin, Ill., U.S.A.

W0 (when formed)—W9DMA, A. Smith, 238 East Main Street, Caledonia, Minn.

Canada, VE2—VE2IR, C. W. Skarstedt, 3821, Girouard Ave, Montreal 28, P.Q.

VE3—VE3QB, W. Knowles, Lanark, Ont.

VE5—VE5HR, Henry Hough, 1785 Emerson Street, Victoria, B.C.

Alaska, K7—K7GSC, J. McKinley, Box 1533, Juneau Alaska.

Cards for the following VK3 stations are on hand and will be distributed at the July meeting or will be forwarded on receipt of the usual stamped addressed envelope:—

ABW, AH, AIJ, AJE, BE, BC, CI, CN, CO, CP, DA, ED, EE, EG, EJ, EN, EO, EQ, EZ, GB, GD, HT, IG, IP, JD, JK, JT, JZ, KG, KR, KU, LL, MC, MJ, MR, NF, NW, OP, PG, QE, QN, RW, RZ, SB, SE, ST, TM, UC, UP, UQ, VD, VJ, VQ, VU, WD, WX, WY, XA, XC, XD, XK, YN, YQ, YR, YT, YV, YW, ZD, ZL, ZT, ZU.

The following prewar cards have just arrived (old call signs) and may be had on application:—VK3's DQ, EX, GD, IM, KB, QC, QE, UE, VW, WU, WW, XP, YQ, ZF.

The QSL Manager is working under difficulties until the list of call signs and addresses is published by the P.M.G. and any Victorian country member of the W.I.A. whose call sign is listed above should advise the QSL Manager.

The manager for outward cards (VK3OF) is into his stride and his address is repeated—VK3OF Frank O'Dwyer, 190 Thomas Street, Hampton, Victoria. All outward cards accompanied by charges should be passed to him. Inward cards for VK3 should still be sent to VK3RJ.

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Heater 6.3 volts  
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Plate 600 volts  
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max.  
Dissipation (CCS)  
Plate max. watts (CCS)  
25



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*Radiotron*

## FEDERAL HEADQUARTERS

**New Executive.**—Following on the recent Convention, a new Federal Executive has been appointed. The members are:—President, Vaughan E. Marshall (VK3UK); Vice-President, R. J. Marriott (VK3SI); Secretary, A. H. Clyne (VK3VX); Treasurer, R. H. Cunningham (VK3ML); Councillor E. D. Trehanne (VK3AFQ). This Executive wishes to record its appreciation, and thanks to the retiring members, T. D. Hogan (VK3HX) for his work as Vice-President and Treasurer, and C. C. Quin (VK3WQ) as Acting Secretary, during the past year, which was an important one for the W.I.A.

**Draft Constitution.**—As you may recollect F.H.Q. has been requested to draw up a Constitution for the unification of the Wireless Institute of Australia, so that it really becomes the Wireless Institute of AUSTRALIA. Federal Executive regard this as a most important job and have already begun serious work on a draft constitution which will be circulated soon between the Divisions for comment and suggestions.

**Badges.**—We have had many requests for lapel badges of the Institute. We have to report that a new set of dies is to be made and we hope we shall be able to make early deliveries. If you wish to have a badge, please advise your Divisional Council as soon as possible. The Divisions have been requested to indicate their requirements to us, so please help them to help us.

**Log Books and Members' Stationery.**—Federal Executive propose producing Station Log Books and Members' Stationery for sale to members at a reasonable cost. We would appreciate letters from as many members as possible giving us their ideas on the form and layout of these very desirable adjuncts to the amateur station. Don't hesitate, write a letter now. The sooner we have the information, the sooner we produce them.

**Frequencies.**—No official word has been received at the time of writing regarding the release for amateur use of the 3.5, 7, and 14 Mc/s bands, but we hear it will not be long now. Please do not jeopardise our early return to these bands by carrying out tests on them (some individuals have very foolishly done so and Federal Executive regard this as a serious breach of trust—play the game, fellahs!).

**DX Contest.**—We have much pleasure in announcing the first International DX Contest to be held after the war of 1939-45. This contest will be next spring (Southern Hemisphere). Please tell your friends here and overseas about it. We shall give you more details next month.

**Service Disposals.**—We shall have some advice soon regarding the purchase of Disposals Equipment.

# *Orders now being booked for the following:*

## **LIMITED QUANTITIES ONLY**

### **Delivery Approx Two Weeks**

FS6 Type Transceiver, manufactured by A.W.A., complete with Vibrator, Power Supply Unit and 8 Valves. Transmitting range, 25/30 miles. Manufacturing cost, over £100. Price complete .. £12 10 0

In Stock—not new but in excellent condition, 101 Type Transceiver, manufactured by A.W.A., complete, but without valves .. £3 0 0

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12-Inch Cathode Ray Tubes, Type VCR140 .. .. . each £1 5 0

Milliammeters, 0/10 milliamps., D.C., moving coil type, 3½ in., uncalibrated. .. .. . Each £0 12 6

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## DIVISIONAL NOTES

### NEW SOUTH WALES

**Secretary:** Peter H. Adams, VK2JX,  
Box 1734 G.P.O. Sydney.

**Meeting Place:** Science House, Gloucester and Essex Streets.

**Meeting Night:** Fourth Friday of each month.

There was a record attendance of well over a hundred members at the May general meeting. At each succeeding meeting the roll-up has been greater. No doubt this can be accounted for in some degree by the rapid increase in membership since the end of the war and also by the fact that more and more amateurs are getting back on the air. In this instance, however, many come because they expected an interesting lecture and demonstration by John Moyle, VK2JU—and they were not disappointed.

The lecturer set out to show how he had gone about the job of designing a 50 watt phone transmitter and a receiver to go with it. The transmitter was not presented as the ultimate in design but as one example of a good transmitter that did everything required of it. Starting with the simplest workable transmitter—an E.C.O. followed by a 807 P.A.—2JU dealt thoroughly with every part of the circuit and explained its good points, not omitting to mention its rather considerable shortcomings.

Next the advantages of crystal control were stressed and it was shown how this transmitter was easily converted to a two stage xtal job. We hope that all prospective new hams at the meeting paid particular attention to this part and realised that the cost of a crystal is more than compensated for by the much greater ease with which correct operation and a good signal can be obtained. An E.C.O. can be made to produce a signal that is indistinguishable from a crystal but it takes painstaking care and experience—qualities not generally possessed by the beginner!

The next step was to add another stage making a three stage xtal transmitter using 6F6G tri-tet oscillator, 6V6G doubler and the 807 running "straight" on 28 Mc. A suitable modulator, using a pair of 807's was described and then the complete transmitter was switched on and demonstrated.

2JU tuned this transmitter up and showed that it really delivered its full output to a 240 lamp as a dummy load. Envelope and trapezoid patterns were shown on the oscilloscope and the modulation capability, around the 100% mark, was clearly demonstrated. Mr. Moyle delivered his lecture in the clear and forthright style for which he is noted and received an excellent hearing. The demonstration of the actual adjustment, testing, and operation of the transmitter was accorded the greatest attention and there is no doubt that this is the type of lecture the boys really want. Council recently appointed Mr. Moyle Technical Officer and it is his job to arrange for lectures at general meetings—not necessarily to give them himself of course—but members can rest assured that there will be more practical lectures and demonstrations of this type.

For the June meeting we have an altogether different type of lecture—on "Developments in Atomic Physics" by John Britton who, during the war, was head of Radio-physics divisions of C.S.I.R. and in charge of radar development. In view of the Bikini Atoll atom bomb tests on the 1st July, this lecture should be of intense interest, especially to the "theory-boys." After all, we all fool around with electrons and electromagnetic phenomena, so should try to learn something about these things.

The following month we come down to earth again with a symposium on rotary beam antennas delivered by

four or five chaps who have built beams which really work.

Visitors at the May general meeting were VK7LL and W6JQJ. The latter has married a very charming Sydney girl and hopes to be on the air as a VK soon.

**"Ignorance is Bliss" Department (Phone Section)**  
We wonder if those phone men who say "hi!" at the end of each remark realise how silly it sounds.

Heard on the air this week:—VK2 phone man: "No OM, you have no sign of a back-wave there. Of course, you, exciter comes through so strongly when your key is up that its hard to tell, but I don't think you have a back wave."—It hardly seems possible, does it?

#### Sport Department (Outdoor Section)

On Sunday, 26th May, a few of the boys had a golf day at Springwood. The Mountains end of the arrangement was capably handled by Bill Moore, who, of course, lives in this very pleasant spot. Golfers included 2HO, 2BG, 2AM, 2ADV, 2RA, 2BA, 2HZ, 2VN and 2JX, and a good time was had by all.

#### Rumour Department (Unconfirmed Section)

A lot of rumours are flying around regarding the 7 and 14 Mc. bands. On fairly reliable authority it seems that the W's, G's, and South Africans should be on both bands by the 1st July. Perhaps FHQ will have some glad tidings for us in this issue.

### VICTORIA

**Secretary:** R. A. C. Anderson, VK3WY,  
Box 2611 W. G.P.O., Melbourne. WM 1579.

**Meeting Place:** Lecture Hall, Chamber of Manufacturers' Building, 312 Flinders Street, City.

**Meeting Night:** First Tuesday of each month.

The June meeting, which was held on the 4th June, in the lecture hall, Chamber of Manufacturers, 312 Flinders Street, Melbourne, was attended by 107, clearly indicates the intense interest taken in Amateur Radio. With 3KN in the chair the meeting got away to an early start in order that 3WG, who lectured on the communication systems employed in the R.A.A.F., to be given ample time for the very interesting and enlightening lecture and discussions that followed.

Visitors were VK5IT, Ivor Thomas, President of South Australian Division of the W.I.A., ZL4HS G. Murray Throp, FBSI R. Froidefond, who were warmly welcomed by the Chairman, whilst others present at the meeting included VK3's OF, AJK, XR, ZV, FR, WG, AH, EA, ZB, BG, RX, JA, ABA, SZ, ED, WJ, QE, UH, TT, TU, GU, GS, AT, CT, XJ, RN, IK, HS, OV, AGS, F, XM, ZG, DK, WC, VV, VX, CF, VR, IC, QC, KM, JL, ZJ, TZ, MC, HX, NY, EK, LN, BJ, VZ, JD, ML, UM, RI, LE, QU, XA, AFQ, LX, YZ, AHM, ZC, AV, JO, OJ, AKI, KC, LS, PU, KN, J. S. Teere, J. Mathews, A. W. Oakes, H. Amor, B. G. Sloane, P. Monfries, A. R. Herald, E. V. Dow, I. G. Groves, J. C. Belcher, A. G. Smith, K. Maroney, E. Tew, W. A. McLoad, E. C. Barry, H. M. Walsh, D. A. Brooke, J. R. Harris, F. Sullivan, C. M. Fraser, D. Taylor, S. J. Chesterfield, R. J. Pollock, A. D. Hatch, D. G. Clarke, F. C. Baunder, W. N. Titteridge, B. Berdielkin, W. L. Sealey, J. Beggs, R. L. West, R. Curnow, A. McKercher.

In the course of general business the chairman reported that with regard to the suppression of man-made electrical interference the Radio Inspector's Office states that they would appreciate complaints of this nature, so you boys who have QRM other than motor cars communicate with Mr. Nelson, Central 5551.

At the present time negotiations are in progress with

the Electrical Federation of Victoria, regarding trade discounts to members of the W.I.A. VK5IT briefly outlined a system which appears to be parallel with that offered by the Electrical Federation of Victoria, and no doubt at our next meeting you will possibly hear the final outcome.

Considerable debate was held on the question of sales tax with regard to the purchase of equipment by licensed amateurs, the major portion of which was utilised in experiments, and Council will discuss this matter generally and make an approach to the Sales Tax authorities to ascertain their views on the subject.

If your worthy scribe's eyes have not deceived him a photo was published in a Melbourne morning paper depicting a well-known DX hound namely "Snow" Campbell, who was recently launched on the sea of matrimony and all Amateurs wish the happy couple a prosperous future and long life. Talking of marriage, congratulations are in order with 3UK as it is understood that over-worked bird, the Stork, was recently seen visiting the Marshalls.

## QUEENSLAND

Secretary: C. Marley, VK4CJ,  
Box 638 J. G.P.O., Brisbane.

Meeting Place: State Service Building, Elizabeth St., City.

Meeting Night: First Friday of each month.

Those members present at the General Meeting of 31/5/46 had the pleasure of listening to a lecture presented by Mr. McNichol of the Queensland University who took for his subject—"The Ionosphere and its rela-

tion to Radio Propagation." The VHF men present were interested to hear that 1947 should see a peak in 50 Mc. DX. The writer's ideas received a very definite boost, I must say. Mr. McNichol also expressed his willingness to assist anyone requiring information related to HF Predictions.

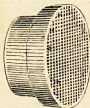
The Federal Convention report was read for the benefit of those present and approval duly passed. We are sure this must be a great relief to FHQ who would, I am sure been greatly dismayed by VK4's non-approval!

With regard to the Field Day scheduled for the weekend (7/8th of June) it was decided to post-pone the affair till the end of June as some intending participants had not been able to complete their gear. Rules were announced and the system of allotting points explained. Stations will be divided into 5, 10 and 25 watt classes, with, as is to be expected, the 5 watters getting the highest score. The world is to be divided into zones (we're carving it up with a bread-knife!) about three in number, Australia and S.W. Pacific, the Americas, and Asia Africa and Europe, the multipliers being 1, 2, 3 respectively.

The subject of student classes has been a stormy one as far as VK4 is concerned, but at last night's Council meeting held at the home of 4HR much time and thought was given the matter and we are calling for a lecturer immediately per medium of the local press. A syllabus will be drawn up pronto from the A.R.R.L. and Admiralty Handbooks, and this will serve as a basis for the lecturer to work on (unless he has a system of his own which meets with our approval) and also will comprise a correspondence course for country men desirous of sitting for their tickets. Fees for the course, which will be of 6 or 12 months length, will be about £5/5/- on present indications.

# HAM SPECIALS—

## Dynamic Microphone Units



A genuine Permag Dynamic Insert, as used in Army Type 19 Tank Equipment.

Impedance: 45 ohms. Diameter: 1 1/2".

Transformers to suit will be available shortly.

**20' -ea.**

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SHOWING PLATES  
& TENSION SPRING

Airforce Type, as used in AT5AR8 Equipment. Bakelite case; size, 1 1/2" x 1 1/4" x 3/4". Will fit standard 5-pin socket and accommodate crystal 3/4" x 3/4".

**3'6 ea.**

**PRICES RADIO 5 & 6 ANGEL PLACE SYDNEY**

**"Local Doings"**

4AW, since his return to civil life, finds very little time for Ham Radio. But look at the money you're making Arthur!

4VJ, Vince, is a strong advocate of the series limiter type of noise silencer and has already convinced several of the local lads of its effectiveness, for instance my experience at 4ZU is that phone signals, which are completely unreadable due to auto QRM, can be made to be perfect copy.

4LP not long back from the Darwin area, and is finding it hard to get on the air owing to lack of space.

4CJ is busy with his duties as Secretary, and in between times works at a Radio Station for the P.M.G.

4SN—Haven't heard from you for a while Frank, but I hope the phone goes at Exhibition time.

4PX was observed in the door way at Trittons carrying on an animated conversation with two bright young things. Was in a hurry Arthur and didn't have time to stop.

4VR responsible for a new sky-wire in the Coorparoo district. Should be more like 'em Rick! But not in the Coorparoo district, says you!

4FE heard on 28 Mc. occasionally, and we believe is finding better results from lower power.

4TY, a pre-war memory, but with us in reality again. Welcome OM. Lets have some dope on your activity.

4ES has a beam up, and according to his pre-beam strength will probably burn up the RF coil in my receiver if he ever swings it around Windsor way.

4JU busy erecting a nifty rotary comprising two antennas, a 3 element for 28 Mc. and a 2 element beam for 14 Mc.

4RB—T'was with pleasure that Council heard your application for membership read out Bob. Revived old and pleasant memories.

4KS intends dashing home of a lunch hour to work some of the juicy ones heard on 28 Mc. about midday in Brisbane.

At this stage of the game we'd like to devote a few lines to some country men, but no dope—no can do! What say, fellers! The address is 4ZU c/o. Box 638J, G.P.O. Brisbane.

**SOUTH AUSTRALIA**

**Secretary:** E. A. Barbier, VK5MD,  
Box 1234 K, G.P.O., Adelaide.

**Meeting Place:** 17 Waymouth Street, Adelaide.

**Meeting Night:** Second Tuesday of each month.

The Annual General Meeting was held on Tuesday, 11th June, at 17 Waymouth Street, there being an attendance of 70. Visitors welcomed by the President included "Snow" Campbell (VK3MR), who was a P.O.W. in Libya and Italy and is mentioned in Rev. Broomhead's book, also Fl-Lt. L. R. Burston (VK3BV, later VK4BV), Fl-Lt. Bill Heinrich (VK5HR) and H. H. Hobcraft (VK5RE).

Nominations to Council for the ensuing year were then read, these being just sufficient to fill all positions, thus rendering a ballot unnecessary. The following were declared elected: "Doc" Barbier (VK5MD), C. H. Baseby (VK5BZ), G. W. Luxon (VK5RX), J. McAlister, E. P. McGrath (VK5MO), Warwick Parsons (VK5PS), I. Thomas (VK5IT), and A. F. Wreford (VK5DW). Mr. J. Kilgariff (VK5JT), a present Council member, preferred not to nominate and it was with regret that members heard of his decision. "Joe" was President at the time of the outbreak of war and, last year, called the inaugural meeting to reform the Institute. The new Council takes office from the 1st of July.

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The Treasurer's report, presented by Cecil Baseby, showed that, as at 31st March, finances were healthy. It was mentioned, however, that the financial year ends in September next so that allowance should be made for the fact that, as most members subscriptions have already been received, there would be more expenditure than income in the second half of the year.

The President presented a comprehensive report on the events of the year. At its conclusion there was loud applause in recognition of the undoubted fine achievements since the start from scratch last July to the present membership of 200 plus. A copy of his report has been sent to "Amateur Radio" and will be found in another part of this issue.

Mr. E. A. Barbier (VK5MD), who has been appointed our Federal Councillor, then dealt in detail and at length with the proceedings at the Convention, giving a most comprehensive account of all that had happened. The President proposed a hearty vote of thanks to the delegate, which was carried with great acclamation.

Prizes were presented to the student members who had made the greatest progress in the first series of A.O.C.P. Classes. Mr. Geo. Ramsay was the winner in theory and Mr. Carruthers in the code section. The "loot" consisted of an 807 in each case.

Amongst other business attended to was the appointment of an Auditor, Mr. C. E. Piper, Chartered Accountant, being elected.

Amateurs who signed the attendance book were:—VK3MR, VK3MV, VK4BV and the following VK5's:—AC, AH, BJ, BZ, CB, DM, DW, FL, FM, GB, HR, IT, JJ, JK, JM, JT, JU, KG, LB, LD, LL, LN, LQ, LR, MD, MF, MI, ML, PM, PS, QM, QR, RE, RK, RT, RU, RX, SP, SX, TX, WK, WR.

At the conclusion of the Annual Meeting, a Special General Meeting was held to consider and, if thought fit, adopt the proposed Constitution, of which copies had been available at previous meetings for perusal by members. The complete draft was first read through by the Secretary and discussion then took place on various sections. One provision, on the suggestion of the Auditor, is to hold the Annual General Meeting in December each year, this coming after, instead of before, the end of the financial year in September. This will necessitate the incoming Council holding office for eighteen months to cover the change over. Another provision fixes annual subscriptions at £1/1/- for full Town Members and 10/6 for all other grades. This is a small increase for the country members, but it was pointed out that the subscription to "Amateur Radio" (which comes free to members) plus the Federal capitation fee, together with postages, etc., leaves no margin, at the present rate, for the general running expenses of the Institute. With one amendment, the draft Constitution was adopted in its entirety, the voting being unanimous and the meeting closed at 10.40 p.m.

Thus the whole of a long evening was devoted entirely to business and members are to be congratulated on their patience and close attention throughout.

At the Council meeting held on 27th May, the following were admitted to membership: Town Corporates, Messrs. R. Shortt, A. W. Baker, F. G. Annars, C. R. Sellick, and R. E. W. May. Country Corporates, L. G. Porter, G. W. Connon, P. Davoren, T. Welling, Town Associates, M. Bradley, F. L. Johnson, P. G. Harper, L. A. Bull, R. E. Tregilgas, A. W. H. Wright, C. A. Harrison, W. L. West, W. J. G. Bailey, J. P. Lysacht, J. Steer, K. D. Broadfoot; Country Associate, A. W. Winter.

Our President (VK5IT) recently visited Melbourne where he found, or, rather, made time to attend to several Institute matters and was present at the VK3 General Meeting. He also finalised the purchase of a particularly good Frequency Meter for this Division and brought it back with him.

With these notes is being forwarded a couple of articles which, it is hoped, may be suitable for publication in "Amateur Radio."



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Mr. John Allan (VK5UL) continues with his monthly Ionospheric Predictions for this locality and his notes for June were published in the local newspaper on the 25th May and are much appreciated.

The next General Meeting is to be held at 17 Waymouth Street on Tuesday, 13th August.

## WESTERN AUSTRALIA

Secretary: H. B. Lang, VK6HL, 42 Ord St., Claremont, W.A.

Meeting Place: Builders Exchange, St. George's Tce., Perth.

Meeting Night: Third Monday in each month.

Since last writing these notes no further meetings have been held, but at this juncture it may be as well to remind members that definite arrangements have been made for the third Monday in each month as the general meeting night of this Division.

Good attendances have been recorded, but they can be improved. Don't let the YF, YL or any L keep you away. The more, the merrier.

Conditions generally in VK6 on 28 Mc. are not so good on the DX but some splendid contacts can be had with VK2, 3, 4 and 5. QSB mars numerous contacts but nevertheless some excellent 100% contacts can be made.

The Island stations and, at times, the W signals break through for short periods. South African signals have been scarce in the past three weeks but have once more re-appeared, though only for short durations. Speculation is rife as to the possible early return of the 14 and 7 Mc. bands or part thereof. South African stations have been officially advised that 14 to 14.3 Mc. and 7.15 to 7.3

Mc. may be used as from midnight on 30th June. At the time of writing, Europeans have been coming through between 0930 to 1000 GMT and their re-appearance is welcomed in VK6.

## What The Boys Are Doing!

6DD, at Guilford, worked G on phone. Evidently that 4 section 8JK is doing its stuff, John. 6HL—in and out of trouble consistently but now has nice fone and rig. Harry says if you want trouble go see him, he's got plenty that can be had for the asking hi. 6HT has Albany on the map again. How about some south port news, Harry? 6KW very busy with 7 and 14 Mc. coil winding interspersed with consistent operating. 6RU is also busy on coil winding and QSL bureau duties. For enthusiasm Jim takes top marks. 6WH—very consistent, busy with new final and plans for receiver alterations. 6WS nearly, but not quite; anxiously waiting return of 14 Mc. band. 6LW has 832 working nicely on 53.07 Mc. and has just completed new exciter. 6HM—very consistent, now working two bands. 6AJ—contemplating a change in the final. 6MB—Bill Bolton, a new one on "Ten," has 8JK rotary beam. 6RG has power supplies and modulator all ready to go; hurry up Ross!

No news from Geraldton members but presumably there is some activity at the Northern Port.

6DF—just completing new final; his 3 element rotary sure does a good job. 6FL is enjoying many pleasant VK contacts; busy on Acorn pre-selector. 6DJ keeps the CW boys busy and has raked in some nice DX with his 807 final. 6NL heard testing fone recently; lost his antenna in a gale, but up again now. 6YL has taken out licence but not heard as yet; when and how, Ruth? 6SA is very quiet at the moment, expect to hear the new rig soon. Jim. 6MU at Merredin seems to be doing well as numer-

ous stations are heard calling him; has T40 final modulated by 6L6G's.

No more this month but don't forget its the third Monday in the month and we want to see YOU there. No excuse please!

## TASMANIA

Secretary: J. Brown, VK7BJ,  
12 Thirza Street, New Town. 'Phone W 1328.

Meeting place, Photographic Society's Rooms,  
162 Liverpool Street, Hobart.

Meeting Night: First Wednesday of each month.

The final Council and General Meeting of this Division, prior to the Annual General Meeting, was conducted at the above address on Wednesday, 6th June, 7.30 and 8 p.m. respectively.

Council—present L. Jensen 7LJ in chair, J. Brown 7BJ, C. Walch 7CW, and A. E. Allen 7PA. Apologies from A. Finch 7CJ, K. Kelly 7LL, M. Loveless 7ML.

Business—To receive report of Dinner Committee, finalise dinner arrangements and general.

New Members—Four applications for full membership were received and passed for general meeting's approval.

General Meeting, as above with F. W. Medhurst 7AH, F. Gee 7RG, A. Morrisby 7VJ, C. Miller 7CM, T. Allen 7AL, E. Nicholls 7RY, T. Connor 7CT, P. Jones 7PJ, D. Watson 7DW, M. Conway 7CL, R. Conrad 7TR ex 2TR, R. O'May 7OM, Koglin, Allenby. Visitors Messrs. Evans, Houston, Chaplin, and Clarke.

The final arrangements for Annual Dinner were announced, meeting 6 p.m., dinner 7 p.m. or as soon after as meeting allows. Dress—informal.

The four membership applications were dealt with

and an election by show of hands declared them elected unanimously.

7AL reported on the QSL Bureau, stating that it was receiving reasonable patronage and presented his statement of cards, handled, etc.

Copies of the minutes of the Federal Convention were tabled for general perusal and make interesting reading, it is of particular note that all States were represented by delegates, the individual comments of delegates on the interest in their respective divisions shows a fervor that we sincerely hope will be maintained.

The lecturer for the evening was Mr. Evans, who was previously welcomed with other visitors, subject was the much heard of Radar on which he gave some very interesting information on both its equipment and operation, illustrated with block diagrams on a none too stable blackboard.

This extensive subject's main points were clearly explained on Stacked Dipoles to C-ray Tubes.

In proposing a vote of thanks to the speaker 7LJ thanked him for coming along and for the time he had put into the subject to deal so widely with it in the short time at his disposal, this was carried with acclamation.

Some interesting exhibits were displayed, one, a high power pulse transmitter, triode capable of several kilowatts, the wonder being its small dimensions, another was a Reflex Magnetron, this tube was given a running description by 7BJ who explained its functions, possible applications, and its inefficiency.

A miniature tube of the 1R5 variety, complete with socket and shield, completed these and of this the socket seemed to claim the most attention.

Ten meter conditions were reported as being very poor of late and causing some concern.

7VJ has a 10 tube super performing fb on 10 mx. using standard 455 k.c. IF's.

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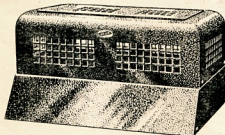
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70M—Bob O'May, an old-newcomer, has staged a comeback on 10 and is using a two stage rig, tri-tet oscillator 807 final and a 1D8-GT receiver regenerative detector and audio, reports say that the outfit is doing fb service and sounds ideal for a portable. Welcome back Bob both to the Ham fraternity and W.I.A.

S. Dahl, ex VK4KA, home on a few days spell from the north west coast districts, reports that several of the coast lads will be operating soon; says Doug. Fisher, 7AB, has gear ready for action.

Sincere regret was expressed at the news that Doug's home had suffered the sad loss of their 3-year-old by accidental drowning about February last.

Syd has been in the North on survey work and plans to take to a caravan soon, says too much away from home lately. Maybe he will take out a portable-mobile licence as he will be without a fixed location.

7CM—Soon to depart for Engand to continue his studies, is having a fair run of 10 mx. by the sheaf of QSL's handed into the Bureau last meeting, wait till you are calling back the other way Charlie!

Congratulations go to 7BJ and 7CT, whose ex-YL's have presented them with a junior op each, both boys and doing well. We sincerely hope the gear wont have to go to make room for the bassinettes chaps and that the QRM will be moderate.

#### IN REVIEW.

It is claimed that there are advantages in using a supply frequency higher than 50 c/s for producing voltages of the order of 2KV or higher, namely, a reduction in the size and cost of the transformer is possible at the

higher frequency, and also filtering problems are reduced with a consequent reduction in cost of the filter components.

"Radio Receiver Design" is the first of a series of articles in which it is intended to cover this subject in great detail. This article is devoted to the mechanical problems such as layout, chassis design, wiring, etc. associated with the design of broadcast receivers.

Also contained in "Radiotronics No. 117," is an article describing a hearing aid using the miniature 1.4 volt types 1S5 and 1T4 valves. A chart of frequency ranges, which has been adopted by the Standards Committee of the Institute of Radio Engineers (U.S.A.) and abstracted from Proc. I.R.E. 33.8 (August 1945).

Radiotronics Technical Bulletins are available by annual (Jan.-Dec.) subscription to Amalgamated Wireless Valve Company Pty. Ltd., 47 York Street, (G.P.O. Box 2516) Sydney, N.S.W.

#### NEW TUBES.

Circuits should be designed to remove high voltage prior to or simultaneously with the filament voltage.

\*\* When D.C. is used on filament, decrease bias by 3.5 volts and return grid to negative filament leg.

† Obtained from (a) fixed supply, (b) control grid resistor, (c) cathode resistor, or by combination of methods.

When the 2E30 is used as an R.F. driver for a tube having a thoriated-tungsten filament, provision must be made so that the driven tube(s) is not operated with plate and screen potential applied but without a bias voltage during the time interval required for the 2E30 to come up to operating temperature.

## S.A. ANNUAL REPORT.

time of his death. The other friend was the late Mr. Harrington, Superintendent of Wireless, P.M.G.'s Department. Mr. Harrington was well known to most of us, and took an interest in the Institute both in his official and private capacities. He was a regular attendant at our functions, and was with us as recently as our last Christmas social. The Institute was represented at the funeral of both, and expressions of sympathy were sent to the relatives.

In conclusion, I would like to thank my fellow councillors for the way they have worked from the time of our first meeting right up to date. There has been a vast amount of work to be done, and there is still much facing the incoming council. You will appreciate that we had to start right from the ground and rebuild the complete structure of this division. Much has been done, but much remains to be done. The year ahead will not be an easy one for the new council. While it would be preferable not to individualise, I know that the other members of the council will support me in paying a special tribute to our worthy Secretary and Treasurer. The bulk of the executive work must naturally fall on their shoulders, and I can assure you that in them we have definitely the right men in the right places, and it is my earnest hope that they will continue to fill their respective positions for years to come. I feel also that I should be permitted to make reference to our Vice-President, Mr. Kilgariff. Joe has decided not to accept nomination for next year's council, and I feel that it is only right that we should record our thanks

for the work that he has done in the position he has held over a number of years. To the other members of the council I say on my own and on your behalf, "Thank you." Finally, I would say to members generally thank you for your support, continue to give it by regular attendance at meetings, the introduction of new members, and (on behalf of the treasurer) the prompt payment of your subscriptions when due. Given this support the Institute will continue to flourish and will achieve the eminence which you and the council would have it achieve.

IVOR THOMAS, VK5IT, President.

## CLEARING THE ETHER.

provide means for monitoring "cathode current" at central control panel, and results in considerable economy in meter requirements. Naturally, jacks may be employed in individual units (quite a common practise) and "through" patch cord employed to connect meter to circuit when desired; however, the system employing common switch facilities quick readings without the untidy appearance associated with the patch cord. Each cathode metering resistor is adjusted to give half scale deflection of 0-1 mA D.C. meter under normal operating conditions, that is, of course, unless off-resonance peaks dictate otherwise.

(f) Bias on buffer amplifier is provided by cathode resistor. As the valve is operating under Class "A" conditions, the grid resistor merely serves as grid-cathode return circuit.

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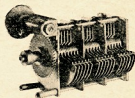


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(g) H.T. supply to the screen-grid is taken from a voltage divider to minimize variation when suppressor is keyed. Resistor shown is used merely for decoupling purposes.

(h) The anode circuit of the buffer amplifier is shunted. This removes direct current from the output switch contacts; thus relieving the latter of unnecessary loading and arcing. Another advantage of shunt feed in this case is that the coil units can be directly earthed.

(j) It has been noted in the past that many hams employ sockets as power pick-ups. This is a very dangerous practice indeed; because when the plug is removed from the socket, the prongs are "alive." Safety demands that the process be reversed, that is, the plug should be mounted on the chassis, then when the socket is removed, provided a proper cover is employed on the rear thereof, power on the recessed legs is not so likely to come in contact with other bodies.

**Some Electrical Aspects of the Tuning System:—**

(a) Scope.—Switching in the oscillator circuit is arranged to provide nine spot frequencies, either crystal or self-controlled, and continuously variable frequencies in two steps, 1.5 to 1.75 Mc and 1.75 to 2 Mc, or such other frequency bands as may be selected, by merely changing coil unit.

(b) Selected spot-frequencies and V.F. Ranges are available by rotating a single knob.

(c) The combination of spot-frequencies available can be altered by changing plug-in crystal, or L-C Units.

(d) Each crystal unit is provided not only with its own tuned circuit, but also a small variable capacitor, shunted across the crystal to permit slight frequency adjustments, to compensate for circuit and temperature conditions.

(e) Each L-C Spot-Frequency Unit is arranged to have correct L/C ratio, and the midjet variable capacitor provides small range for final adjustment of operating frequency. Further changes can be effected by altering value of main capacitors.

(f) The V.F.O. Unit also has internal capacitor to provide correct L/C ratio.

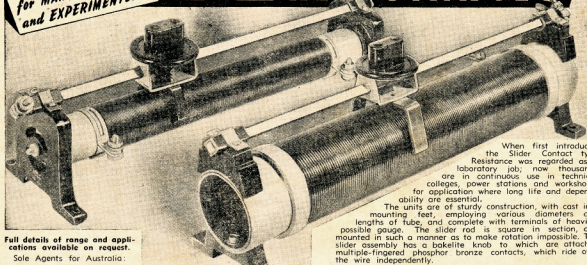
(g) The output circuit of the buffer amplifier is arranged so that any one of four tuned circuits may be introduced into the anode circuit, to provide one or more frequencies between 1.5 and 2 Mc, and 3 to 4 Mc as desired. If considered desirable, one position could be arranged to provide continuously adjustable resonance, by using external capacitor similar to that used in V.F.O.; in fact, it could even be "ganged" with the latter. By providing more than one pre-tuned frequency, the output can be levelled over a wide range. This aspect will be covered more fully under the heading of "Harmonic Amplifiers."

(h) Link-coupled output is designed to provide low impedance link to the following stage, and permit the use of "stagger tuning" when necessary.

(j) General.—Maximum flexibility is the main reason underlying the use of completely self-contained plug-in units, a method which of necessity involves a lot of extra minor components; for instance, some hams already possess crystals for the 7 and 14 Mc bands, thus if we restricted the use of B.F.G. to below 4 Mc by the use of fixed components, these crystals would have to be discarded, whereas now a set of units can be plugged in to meet this demand. Selecting the sockets with the shortest wiring for the highest frequencies. The whole subject will receive much greater attention under the heading of "Mechanical Aspects of B.F.G." in part 4 of this series.

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**FOR SALE.**—Burton-Webber Modulated Oscillator, range 140 kc. to 25 mc., A.F. output, battery operated, £12. Also Valves: 210, TBO4/10, 281's, 280's, with low loss sockets. Can Type Electrolytics, Audio Trannies. VK5UX, 21 Railway Terrace, Kadina, S.A.

**FOR SALE.**—Surplus Taylor T40 (Brand New). Price £2/10/- . VK3FA, BYADUK, Vic.

**FOR SALE.**—Two button 9002 valves, three 9003, 25/- each, unused, will except two 9001 part or exchange. Stevens, 59 Rochester Road, Balwyn, E.8.

### FERROTONE BY KINGSLEY.

From Kingsley Radio this month comes "The new Gangless Superhetrodyne"—"How to build and operate it." A manual of instruction on the Kingsley Ferrotone B/C receiver. This is a manual describing the construction and alignment of a 4/5 valve broadcast receiver built around the new Kingsley Ferrotone Unit, which is a tuning unit which covers the broadcast band 550-1600 Kc. by the variation of inductance brought about by the movement of the iron slugs of the mixer and oscillator coils instead of the more conventional method of capacitance tuning using the gang condenser.

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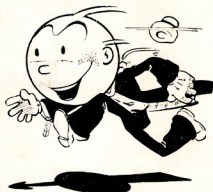
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